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ABSTRACT

This packet contains 27 lesson plans for integrated academic and vocational education courses. Lesson plans for the following courses are included: horticulture, algebra, physical science, general mechanical repair, foods and nutrition, home economics, and microcomputer applications. Some of the topics covered are as follows: seed germination, controlling environmental conditions of horticultural plants, structures used in landscape design, cost analysis for producing specified vegetables, real-world linear equations, collecting data using precision instruments, estimation skills, organizing and graphing data, ordered pairs, formulas, ratio and proportion, estimation, proportion of chemical additives per volume of liquid, calculating speed, boiling points, electricity, melting and freezing points, reading a micrometer, transportation costs, water pump repair or replacement, estimating costs of engine rebuilding, recipe conversion, creating a budget, calculating income and income taxes, comparison shopping, and spreadsheets. Lesson plans consist of lesson objectives, materials needed, activities, evaluation activities, listing of the integration partner course, essential elements, collaborative topics, and integration partner activities. (KC)

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ED 362 697

Integrated Lesson Plans

Mansfield ISD

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INT-101-LP

Course: Horticulture **Lesson Topic:** Seed germination

Essential Elements: 6u—3, 4, 7

Lesson Objective: Students will be able to identify four environmental factors affecting seed germination.

Materials: *Horticultural Plant Production*, Instructional Materials Service (IMS), Texas A & M University; variety of cool-weather and warm-weather vegetable seeds; planting containers; and potting media.

Activity:

1. Introduce factors affecting seed germination using material on page 3 in IMS materials.
2. Plant an assortment of cool-weather and warm-weather seeds. Vary temperature of planting locations between full sun, room temperature, refrigerator. Check daily. Record affect of temperature on sprouting time.

Optional Activities: Seed stratification experiment and seed scarification experiment also contained in the IMS materials.

Evaluation Activity: Students will plan and conduct their own seed germination experiment. Results will be graphed and analyzed, then presented to the class. Class members will be rated on their personal experiment and presentation of data, as well as on their participation in class discussions concerning other student's experiments. This discussion should include assets and limitations of each experiment design and the relationship of findings throughout the class. Each student will then write-up the conclusions he/she feels can be drawn from the class findings and any possible applications for good horticultural practice.

Integration Partner Course: Algebra I

Essential Elements: 3b, 3g, 3j, 6d

Collaborative Topics: Rates and proportion. Interpreting graphs

Integration Partner Activity:

1. Express data from seed germination experiments using rates and proportions.
2. Use data from seed germination experiments to produce and analyze graphs.

Course: Horticulture **Lesson Topic:** Controlling the environmental conditions of horticultural plants

Essential Elements: 6u—6, 7

Lesson Objective: Students will be able to read a thermometer and humidistat and describe their use in regulating the temperature and humidity in a greenhouse.

Materials: *Horticultural Plant Production*, Instructional Materials Service (IMS), Texas A & M University; thermometer; wick; humidistat; glass jar.

Activity:

1. On a warm sunny day, place a thermometer in a large glass jar. Place the lid on the jar and set it outside in the sun. Do not face the thermometer directly into the sun. After 45 to 50 minutes, record the temperature inside the jar. Compare the outdoor temperature with the temperature inside the jar. Discuss the conclusions that could be made about the difference in temperature. Now read IMS material concerning "greenhouse effect."
2. Using a thermometer, record the outdoor temperature. Record both "dry bulb" temperature and "wet bulb" temperature. Use the psychrometric chart in the IMS materials to determine the relative humidity of the air. Now read the IMS materials describing humidistats.

Evaluation Activity: Students should keep a log and record the temperature and humidity inside a greenhouse and outdoors. Use various cooling, ventilation, and misting methods to control the temperature and humidity inside the greenhouse. Working in small groups, the students will prepare graphs and present information to the class on controlling temperature and humidity in a greenhouse. Participation in the class discussion will be a part of the competency rating for this objective.

Integration Partner Course: Algebra I

Essential Elements: 1b, 3e, 3g, 3j

Collaborative Topics: Graphing linear equations and inequalities, interpreting graphs

Integration Partner Activity:

1. Use temperature and humidity information in examples when writing equations.
2. Interpret date obtained from the psychometric chart in the horticulture IMS materials.
3. Use data from individual student experiments to portray data in graph form.

Course: Horticulture **Lesson Topic:** Structures used in landscape design (Wooden fences)

Essential Elements: 6u—1, 3, 6

Lesson Objective: Students will be able to estimate fencing cost by calculating board foot and price.

Materials: *Landscape Design, Construction, and Maintenance,* Instructional Materials Service (IMS), Texas A & M University.

Activity: Put students in small groups. Give each group the IMS materials describing wooden fences and the formula for calculating board feet. Let the group practice calculating board feet.

Evaluation Activity: In small, cooperative learning groups, students will create an original landscape design including a wooden fence and a cost estimate for the materials required to construct the fence. Each group will present its design and estimated cost to the class.

Integration Partner Course: Algebra I

Essential Elements: 1e, 2d, 4a, 6f

Collaborative Topics: Formulas and monomials

Integration Partner Activity: Use calculation of board feet in examples and practice sets when discussing the real-world application of solving problems using formulas.

Course: Horticulture **Lesson Topic:** Cost analysis for producing specified vegetables

Essential Elements: 6u—8

Lesson Objective: Students will be able to conduct an estimated cost analysis for producing tomatoes, potatoes, onions, beans, okra, corn, peas, and lettuce.

Materials: Teacher made worksheets for figuring production cost, yield, and market value of each vegetable

Activity: Students produce a vegetable garden containing each of the specified vegetables. A running tally of costs for planting and maintaining the crop will be kept as will a yield chart and a market value analysis.

Evaluation Activity: Written reports on production costs, yields, and market value will be completed by each student. All students will make a oral summary report to the whole class. At the conclusion of the reports, the class will discuss methods and procedures that seemed to produce a lower cost per yield.

Integration Partner Course: Algebra 1

Essential Elements: 2a, 2b, 2c, 3i

Collaborative Topics: Linear equations

Integration Partner Activity: The information gathered by the horticulture students will be used in algebra class during equation application activities. (See the algebra lesson plan in this set of integrated plans dealing with determining the amount of disposable income for a family.)

Course: Algebra I **Lesson Topic:** "Real-world" linear equations: determining disposable income

Essential Elements: 2a, 2b, 2c, 3i **TAAS:** 2a, 2f, 6, 7, 8, 9, 12a, 13a, 13b,

Lesson Objective: The student will be able to :

1. write equations involving real-world situations.
2. solve real-world linear equations.
3. justify solutions to real world situations.

Materials: pre-established budget form.

Activity: The students form cooperative, learning groups. Each group is presented with a problem involving a family from the area with a set net income and supplements from various agricultural endeavors. Given the pre-established budget, the groups will determine disposable income for the family. Each group will accomplish this by writing systems of equations and solving the system by a pre-assigned method.

Evaluation Activity: Each group will answer (and justify with budget/cost data) the following question: Based on the disposable income value obtained in this lesson, could you attend five concerts, a movie every weekend, and buy two pairs of Nike Air sneakers in a one-year period, while the rest of the family is allowed the same spending opportunities?

Integration Partner Course: Horticulture, General Mechanical Repair

Essential Elements: 6u—8

Collaborative Topics: Cost analysis for producing specified vegetables, transportation costs and rebuilding V6 and V8 engines

Integration Partner Activity:

1. Horticulture students will complete the lesson plan activity on cost analysis for producing specified vegetables in this packet of integrated activities and bring the data on production costs, yields, and market value of their vegetable garden to use in this algebra budget activity.
2. General Mechanical Repair students will complete the lesson plan activities on rebuilding V6 and V8 engines and transportation costs contained in this packet of integrated activities and bring their data to be used in the algebra budget activity.

Course: Algebra I **Lesson Topic:** Collecting data using precision instruments; estimation skills

Essential Elements: 1b, 1c **TAAS:** 1b, 1d, 4a, 4b, 4d, 11c

Lesson Objective: The student will be able to:

1. use a micrometer to make precision measurements.
2. estimate the size of various objects given the correct measurement of one object in the set of three.

Materials: Micrometer, one set of three objects in various sizes for each small group, and one engine valve stem for each group

Activity: Students will form small, cooperative learning groups. Each group will watch as the teacher or a student from the GMR class demonstrates how to read a micrometer, then will practice with the engine valve stem. The groups will also practice the correct written form for micrometer measurements.

Now each group will measure one object in a set of three and estimate the correct measurement of the other two objects. Each group is to come to a consensus concerning the estimated measurements, then trade their set of objects with another group and repeat the measurement/estimation exercise until each group has worked with each set of objects. The groups will now measure all the objects to see which group was the most accurate in their estimations.

Evaluation Activity: Each group will brainstorm reasons for developing estimating skills, listing as many everyday living and work applications as possible. Each group will present its list to the class.

Integration Partner Course: General Mechanical Repair

Essential Elements: 2d, 2e, 1d

Collaborative Topics: Reading micrometers

Integration Partner Activity: Students in the GMR class will have practice in precision measurement using the micrometer and use technical manuals to check their accuracy. Problem-solving activity will follow concerning differences in their measurements and the readings listed in their technical manuals. (See lesson plan in this packet of integrated plans)

Course: Algebra I **Lesson Topic:** Organizing and graphing data; making predictions

Essential Elements: 3g, 3j **TAAS:** 2c, 10, 11f, 12b, 13a

Lesson Objective: The student will be able to:

1. determine the domain and range.
2. collect data and organize it into a graphical representation.
3. analyze data and make predictions.

Materials: Wildlife data resources

Activity: Each small, cooperative learning group will select a species of animal. Using the resources available, the group will collect data concerning decreases in population. Based on the data collected, the group is to predict the possibility of the species becoming endangered and in what time frame.

Evaluation Activity: Given a set of statistical data on an endangered species, each small group shall determine the status of their assigned species.

Integration Partner Course: Agriculture: Wildlife Management

Essential Elements: 6x—1, 2, 3, 4,5, 6

Collaborative Topics:

1. Analyze the importance of wildlife management
2. Discuss policies of wildlife management
3. Identify ecological concepts
4. Identify wildlife species
5. Understand the management of wildlife populations

Integration Partner Activity:

1. Research for data could be done in the wildlife class materials.
2. The group could report their findings to the wildlife class and open the floor for discussion.
3. Points for credit could be earned and recorded in the SAE record books.

Course: Algebra I **Lesson Topic:** Ordered pairs; coordinate plane

Essential Elements 3a, 3b, 3c, 3f, 3i, 3j **TAAS:** 2e, 2f, 10, 11f, 12

Lesson Objectives: The student will be able to:

1. determine domain and range.
2. investigate and compare properties of the relation.
3. identify the relationship among a linear equation, a set of ordered pairs of numbers, and a set of points on a coordinate plane.
4. use linear equations as models of real-world problem situations.
5. graph a line from its equation.
6. make a prediction from a graph.

Materials: World almanacs

Activity: Put students into cooperative learning groups. Give each group a world almanac and have them select five countries noting population over the past half-century. Represent data as ordered pairs and plot on a coordinate plane. Students will determine the equation of the line which best models the data. From the graph, the students will determine the rate of change, predict the population in the year 2000, and compare these values against the values obtained from the linear equation.

Evaluation Activity: Have each cooperative learning group create a fictitious country, complete with population statistics for the last half-century. Each group is required to compile data related to the objectives listed above. The teacher will collect all fictitious country data and redistribute so that no group has its own data. Each group will then represent the data as ordered pairs and plot on a coordinate plane. Students will determine the equation of the line which best models the data. From the graph, the students will determine the rate of change, predict the population in the year 2000, and compare these values against the values obtained from the linear equation. Upon completion, each group will present its findings to the whole class.

Integration Partner Course: World geography

Essential Elements: 3E

Collaborative Topics: Map reading; analyzing population data

Integration Partner Activity:

In cooperative learning groups, students will compile geographical implications for population distributions. Each group will study a specific region of the world and describe the geographical impact on population growth and movement. Reports of these regional studies will be given to the algebra students as aids in creating their fictitious country statistics.

Course: Algebra I **Lesson Topic:** Formulas, ratio and proportion, estimation

Essential Elements: 1e **TAAS:** 2a, 2d, 2e, 3b, 4c, 11a, 11d, 13a, 13b

Lesson Objective: The student will be able to:

1. choose appropriate formulas.
2. evaluate formulas.
3. examine reasonableness of answers.
4. solve problems using ratio and proportion.

Materials: Teacher made information/worksheets.

Activity: Put students into cooperative learning groups. Present students with a problem involving the design for a swimming pool. The students must determine the placement of the pool, the amount of fence needed to surround the lot, tile needed to surround the pool, tile for walkways, concrete for the lining of the pool, and the volume of water needed to fill the pool.

Optional activity: Before students begin their planning process, have a guest speaker from a pool construction company talk to students about design principles and materials.

Evaluation Activity: In cooperative learning groups, students will be asked to design a scale model of the pool based on the data given by teacher. Each group will present its design to the class. Teacher and class members rate each design on the following two conditions and upon any other conditions agreed upon in advance by teacher and students: Is the model proportional and is the model realistic?

Integration Partner Course: Horticulture

Essential Elements: 6t—1, 3

Collaborative Topics: Identifying structures used in landscape design

Integration Partner Activity:

1. Learn/practice the formula for calculating board feet.
2. Practice estimating skills using cost estimates for wooden fences.

Course Physical Science **Lesson Topic:** Proportion of chemical additives per volume of liquid

Essential Elements: 1a, 3a, 5a, 10a

Lesson Objective: The student will be able to calculate the amount of chlorine to add to various pools based on volume of water.

Materials: Blocks of wood in various shapes to represent different pool shapes, rulers, .3 liters of chlorine per 4 cubic meters of water

Activity: Assign students to cooperative learning groups. Each group chooses one block of wood and measures its length, width, and height in centimeters. Then calculate the volume of the block in cm^3. Convert the volume from cm^3 to m^3. (note: for lab purposes 1 cm^3 = 1m^3.) This will be the volume of your pool. Determine the amount of chlorine needed in your pool using the following ratio:

$$\frac{\text{.3 liters of chlorine}}{\text{4 meters}^3 \text{ of water}}$$

Follow the same procedure for a different block of wood with an irregular shape. Determine the amount of chlorine needed for the second block.

Evaluation Activity: The lab write-up for the activity described above.

Integration Partner Course: Algebra I

Essential Elements: 1e, 3b, 6f **TAAS:** 2d, 2e, 3b, 4c, 11a, 11d, 13a, 13b

Collaborative Topics: Formulas, ratio and proportion, estimation

Integration Partner Activity: Use swimming pool chlorine ratio/portions for instructional examples and problem-solving activities.

Course: Physical Science **Lesson Topic:** Calculate speed

Essential Elements: 1a, 3a, 5a, 10a

Lesson Objective: Students will be able to calculate speed by using the formula SPEED = DISTANCE TRAVELED / TIME

Materials: stop watch, premeasured distance on road, teacher-made worksheet

Activity: Students gather for activity in small, cooperative learning groups. Place visible markers along sides of road to mark distances of 1320 ft. , 2135 ft., 1053 Ft., and 2020 ft. The students should stand at a safe distance from the roadway and far enough away from the road to have a good vantage point of the entire distance. Small groups should take turns using the stop watch to time cars as they pass the distance markers. Then record calculations on the worksheet supplied by the teacher.

Evaluation Activity: Completed calculation worksheets.

Integration Partner Course: Algebra I

Essential Elements: 1e, 2b, 2c, 3b, 3i, 6d, 6f **TAAS:** 2c, 2f, 10, 11f, 12

Collaborative Topics: Rates and proportion, formulas, linear equations.

Integration Partner Activity: Use the speed formula and data gathered in the science experiment for algebra classroom work in rate and proportion, formula, and linear equations.

Course: Physical Science **Lesson Topic:** Boiling points

Essential Elements 1a, 2a, 5a, 5b

Lesson Objective: The student will be able to determine the boiling point of various liquids.

Materials: Bunsen burner, ring stand, three-250 ml beakers, thermometer, graph paper, three different solutions (water/ 1.0 m NaCl/ 1.0 m Sucrose), teacher made lab worksheets.

Activity: Set up a ringstand, wire gauze, and Bunsen burner for each small cooperative learning group. Add 50 ml of a solution to one of the beakers. Place the thermometer inside the beaker and record the starting temperature of the solution. Place the beaker on top of the wire gauze and begin heating. Record the temperature every 30 seconds on data table. Continue to heat until the solution is boiling vigorously. Keep heating until the same temperature has been reached for two minutes. Follow the same procedure until all the three solutions have been tested. Then graph data.

Evaluation Activity: Lab write-up.

Integration Partner Course: Algebra I

Essential Elements: 1b, 1c **TAAS:** 1b, 1d, 4a, 4b, 4d, 11c

Collaborative Topics: Rates and proportion, formulas, linear equations

Integration Partner Activity: Use data from science experiment for examples in applications of algebra topics rates and proportions, formulas, and linear equations.

Course: Physical Science **Lesson Topic:** Electricity

Essential Elements 6b, 8a, 7a

Lesson Objective: The student will be able to determine the cost of operating a blow dryer.

Materials: Have students bring their own blowdryers with tags attached giving electrical information. Provide brochures from the local electrical utility company listing cost per kilowatt hour.

Activity: Students are to work in small groups. Each group should have the following information:

POWER = VOLTAGE X AMPERAGE

ENERGY = POWER X TIME

KILOWATT HOUR = KILOWATTS X HOURS

COST OF OPERATING = KWH X COST

Students find amperage and voltage information on hair dryers, then apply this information to the formulas above.

Evaluation Activity: Lab write-up for hair dryer operating cost and extension examples such as electric soldering iron, a table saw, theater lighting, and schoolroom lighting.

Integration Partner Course: Algebra I

Essential Elements: 2a, 2b, 2c, 3i, 3k **TAAS:** 6, 7, 8, 9, 12a, 13a, 13b, 2a, 2f

Collaborative Topics: Formulas and monomials, graphing linear equations and inequalities

Integration Partner Activity: Use these formulas and the data obtained in the science experiment for application examples when graphing information in algebra class.

Course: Physical Science **Lesson Topic:** Melting/freezing points

Essential Elements: 1a, 2a, 5b, 9b

Lesson Objective: The student will be able to determine the melting and freezing points of paradichlorobenzene from the graphed data.

Materials: Per group: one large test tube, 250 ml beaker ring stand, Bunsen burner, wire gauze, test tube clamp, one Celsius thermometer, 5 grams of paradichlorobenzene, teacher-made lab worksheet

Activity: Each small, cooperative learning group sets up ringstand, wire gauze, and Bunsen burner. Add 200 ml of water to a 250 ml beaker and bring the water to a boil. Add 5 grams of paradicholobenzene to a test tube. Place the thermometer inside the test tube. Record the starting temperature. Lower the test tube and thermometer into the boiling water. Turn the Bunsen burner off and record the temperature every 15 seconds for a total of 6 minutes. Graph data.

Evaluation Activity: Lab write-up.

Integration Partner Course: Algebra I

Essential Elements: 3g, 3j **TAAS:** 2c, 3a, 10, 11f, 12b

Collaborative Topics: Interpreting graphs

Integration Partner Activity: Use data from the science experiment to practice graphing data and interpreting graphed data.

Course: General Mechanical Repair **Lesson Topic:** Reading micrometer

Essential Elements: 2d, 2e

Lesson Objective: Students will be able to read a micrometer.

Materials: Micrometers, engine valve stem, technical manuals

Activity: In small, cooperative learning groups, the students will measure engine valve stems and check their measurements with those listed in the technical manuals for that particular engine type.

Evaluation Activity: Each group will record their micrometer readings and the readings listed in technical manuals. Any discrepancies will be used in problem-solving exercises to determine the cause (example: misreading or defective part)

Integration Partner Course: Algebra I

Essential Elements: 1 b, 1 c **TAAS:** 1b, 4a, 4b

Collaborative Topics: Basic concepts review, reading precision instruments for data collection

Integration Partner activity: Students will use the micrometer in the algebra class for practice in gathering data with precision instruments for use in real-world application exercises of algebraic principles.

Course: General Mechanical Repair **Lesson Topic:** Transportation costs

Essential Elements: 1a, 1b, 1c

Lesson Objective: Students will be able to estimate the cost of transportation as a part of an overall family budget.

Materials: Labor rate guides, parts price quotes, speaker (insurance firm)

Activity: Students form small, cooperative learning groups. Each group will be assigned a specific automobile or truck model (a variety of engine types 4, 6, and 8 cylinder). The groups will be given a list of the most frequent repairs for their model. They are to use labor rate guides and price quotes (either given to them in advance or assign the groups to contact local parts supply stores to gather information for themselves). Each group is to complete an estimate for repairs for their assigned model. Each group will then figure fuel and oil costs based upon manufacturers recommendations, as well as tire replacement costs. An insurance representative will speak to the class on insurance rates and the tables that insurance companies use to figure value for the automobiles.

Evaluation Activity: Each group will present its vehicle transportation cost estimates information to the class. The groups will be required to prepare visuals to demonstrate their figures. The class as a whole will compare all the cost estimates and make decisions concerning "best buys" for different income levels. Students will be rated on their group presentation and on their participation in the whole group process.

Integration Partner Course: Algebra I

Essential Elements: 2a, 2b, 2c, 3i, 6d **TAAS:** 2e, 2f, 6, 7, 8, 9, 12a, 13a, 13b

Collaborative Topics: Linear equations, rates and proportions

Integration Partner Activity: Data obtained in the transportation cost unit will be used in the algebra class during presentations on formulas and rates and proportions. Students will use the information to design a formula for assessing the proportions of the different entries in a family budget.

Course: General Mechanical Repair **Lesson Topic:** Water pump repair or replacement

Essential Elements: ddd 1a Section 1

Lesson Objective: The students will be able to estimate the cost of repairing a water pump vs replacing the pump.

Materials: Water pump, labor cost guides, parts price quotes, speaker (swimming pool maintainence)

Activity:

1. Use labor cost guides and parts price quotes to compare the costs of repair and replacement of water pumps for specific types of cars and trucks. Relate this activity to the transportation cost estimates unit included in these integration plans. Use data in figuring total transportation costs.
2. Invite a representative from a swimming pool maintainence company to talk specifically about swimming pool pumps, their frequency of breakdown, and cost of replacement. Students should have questions ready, such as, "What preventative maintainence can be undertaken to extend the life of these pumps?"

Evaluation Activity: Students will form small, cooperative learning groups and brainstorm all the similarities and differences that they noticed in the upkeep and repair of automotive water pumps and swimming pool pumps. How do the two pump types compare in relation to cost of repair and replacement?

Integration Partner Course: Algebra

Essential Elements: 2e, 6b, 6c, 6d, 6f

Collaborative Topics: Formulas, rates and proportions

Integration Partner Activity: Use the information gathered by the GMR students when the algebra class is working on pool design.

Course: General Mechanical Repair **Lesson Topic:** Estimating costs of engine rebuilding

Essential Elements: 1a, 1b, 1c

Lesson Objective: Student will be able to estimate the difference in the cost of rebuilding a V-8 engine versus a V-6 engine.

Materials: Labor cost guides, parts price quotes

Activity:

1. Students will form small, cooperative learning groups. Each group will be assigned a particular model of car or truck, some V-6 and some V-8. The groups will use the labor cost guides and the parts price quotes to estimate the cost of rebuilding their assigned engines.
2. Students will use these amounts in their transportation cost estimate unit in these integration lesson plans.

Evaluation Activity: Each group will report their findings to the whole class. The groups will be required to present a cost estimate sheet as they would for a customer of an automotive repair garage. The differences in rebuilding V-6 engines will be discussed and the cost differences among the V-8 engines will be discussed. Then the comparison between "agreed upon costs" for the V-6 and V8 will be noted for the transportation cost estimate unit.

Integration Partner Course: Algebra 1

Essential Elements: 3b, 3g, 3j **TAAS:** 1d, 3a, 11f, 12b

Collaborative Topics: Graphing linear equations/inequalities, interpreting graphs

Integration Partner Activity: The information gathered by the GMR students will be used in the proportional spending budget unit in the algebra class.

Course: Foods and Nutrition **Lesson Topic:** Recipe conversion

Essential Elements: (i)(1)(I), (i)(3)(E)

Lesson Objective: Students will be able to multiply or divide to get a desired amount of a certain ingredient.

Materials: This worksheet and any recipe; Recipe conversion, *World of Foods*—Prentice Hall, pages 213-214

There will be times when you will want to prepare a particular dish, but your recipe yields too many or too few servings, or calls for an ingredient you don't have available. Rather than giving up the idea of making the food, or guessing at another way to prepare it, you can use some accepted methods of modifying the recipe.

When it comes to quanitiy or size, many recipes provide enough food for six to eight servings. Because of this, it may be difficult to find recipes that will give the exact number of servings you need at a particular time. If you are cooking for only two people, you would not want to use a recipe that would serve six or eight. When friends come for dinner or the size of your family increases, you may find that the recipe is too small. By using multiplication and division, however, you can increase or decrease the size of the recipe to meet your needs.

To halve a recipe, use exactly one-half the amount of each ingredient. To double a recipe, use exactly twice the amount of each ingredient listed in the recipe.

Activity: Double the recipe on the attached sheet, After you have completed doubling the recipe, the next step is to half the recipe. Do both of these activities on the back of your recipe sheet.

Evaluation Activity:

Integration Partner Course: Algebra I

Essential Elements: 6b, 6f, 3f, 3h, 3i

Collaborative Topics: Rates, proportions, linear equations

Integration Partner Activity: Students in Algebra I will use rates and proportions to increase or decrease amounts in recipes. Students will use equations to determine cost of various recipes and the effects on cost of increasing or decreasing recipes.

German Chocolate Cake

½ cup boiling water
1 bar (4 oz.) sweet cooking chocolate
2 cups sugar
1 cup margarine or butter, softened

4 egg yolks
1 teaspoon vanilla
2 ½ cups cake flour
1 teaspoon baking soda
1 cup buttermilk
4 egg whites, stiffly beaten

Heat oven to 350°. Grease pan. Line bottoms of pan with waxed paper. Pour boiling water on chocolate in small bowl, stirring until chocolate is melted; cool.

Mix sugar and margarine in large mixing bowl until light and fluffy. Beat in egg yolks one at a time. Beat in chocolate and vanilla on low speed. Mix in flour, baking soda and salt alternately with buttermilk, beating after each addition until batter is smooth. Fold in egg whites.

Bake for 35 minutes or until done.

Course: Foods and Nutrition **Lesson Topic:** Creating a budget

Essential Elements: (c)(4)A; (b)(5)(c)

Lesson Objective: The student will be able to calculate and estimate the cost of living.

Materials: Budgeting information sheets

Activity: In small, cooperative learning groups, the students will:

1. play the game of "Life" to simulate exchange of money.
2. given a family income and expense scenario, each group will create a budget.

Evaluation Activity: Each small group will present its budget to the class. At the conclusion of the presentations, the class will discuss the expenses that occur in most family budgets and when special "circumstance items" that some families may need to include in their budgeting plans.

Integration Partner Course: Algebra 1

Essential Elements: 1 e, 2a, 2b, 2c, 2g, 3i, 3k

Collaborative Topics: Linear equations, formulas and monomials

Integration Partner Activity: The cost of living information gathered for the algebra budgeting activity by the general mechanical repair and horticulture classes can be used in this budgeting activity. (See the lesson plans included in this packet of integration plans from the algebra, GMR, and horticulture classes.)

Course: Comprehensive Home Economics **Lesson Topic:** Calculating income and income taxes

Essential Elements: (a)(6)(F)

Lesson Objective: The student will be able to:

1. estimate weekly/biweekly wages after deductions.
2. calculate income tax and complete the short tax form.

Materials: Sample paychecks including deduction information, tax schedules, short tax forms

Activity: In small, cooperative learning groups, students will:

1. practice calculating hourly wages and deducting percentages as shown on the practice paychecks.
2. use the tax tables and tax form to calculate income taxes.

Evaluation Activity: Each group will be given payroll information, deduction percentages, tax tables and forms. The students will figure net pay for each month and then use tax information to estimate annual taxes.

Integration Partner Course: Algebra I

Essential Elements: 1b, 1c **TAAS:** 2d, 2e, 2f, 11a, 13a, 13b

Collaborative Topics: Basic concepts, formulas

Integration Partner Activity: Use information from paycheck data and tax information when practicing basic concepts such as percentages and in applying the use of formulas to everyday living situations. This information should also be discussed when the algebra class is working on the budgeting unit included in this packet of integrated plans.

Course: Foods and Nutrition **Lesson Topic:** Comparison shopping

Essential Elements: (i)(1)(H)

Lesson Objective: Students will be able to compare the prices of name brand and generic food products.

Materials: Both the generic and name brand offering of five products, blindfolds

Activity:

1. The students will be blindfolded and asked to taste the five products in generic and name brand form. They will be asked to identify the differences in taste and make a preference for one of two samples of each of the five foods. At the end of the taste test, the students will identify the generic products that compared well with the name brand products.
2. The students will take a trip to the grocery store to make unit comparisons of name brand to generic products. Price differences will be recorded.
3. In small, cooperative learning groups, the students will take the taste test results and the comparison pricing results, then come to a consensus as to the "best buys" considering taste and price. Each group will present its decisions to the class.

Evaluation Activity: Based upon its "best buy" decisions, each group will write and present a 60-second advertising spot extolling their choice.

Integration Partner Course: Algebra I

Essential Elements: 3b, 3g, 3j **TAAS:** 3a, 10, 11f, 12b

Collaborative Topics: Basic concepts, formulas

Integration Partner Activity: The activity of comparing unit pricing can be used in algebra during review of basic concepts such as multiplication of decimals and formulas for converting one unit of measurement to another for the purpose of direct comparison. The information the home economics students gather should be used in the budgeting unit delivered in the algebra class. (See the lesson plan in this packet of integrated plans.)

Course: Microcomputer Applications **Lesson Topic:** Setting margins

Essential Elements: 2b

Lesson Objective: Students will be able to figure left, right, bottom and top margins for pica and elite pitch printing.

Materials: Information sheets for pica and elite horizontal spacing and vertical spacing.

Activity: Students will complete two word processing assignments setting the margins according to instructor specifications.

Evaluation Activity: Students will complete a word processing assignment, with margin specifications: 2-inch side margins, one and 1½ inch top margin, and one and 1½ inch bottom margins.

Integration Partner Course: Algebra I

Essential Elements: 1b, 1c **TAAS:** 1b, 4a, 4b

Collaborative Topics: Basic concepts

Integration Partner Activity: When reviewing the basic concepts involving computation with fractional numbers, practical application examples can include figuring margins for typed documents.

Course: Microcomputer Applications **Lesson Topic:** Spreadsheets

Essential Elements: 4b, 4d

Lesson Objective: Students will be able to take family budget information and convert to spreadsheet format.

Materials: Data from the algebra budgeting unit (also using information from the general mechanical repair, horticulture, and home economics classes); teacher made worksheet containing "what if" conditions for budgetary changes.

Activity: Students will take data from algebra budgeting unit and incorporate into a spreadsheet. The students will then practice the "what if" worksheet.

Evaluation Activity: Students from the algebra, home economics, horticulture, and general mechanical repair classes will each submit two "what if" conditions for the budget information. The microcomputer applications class will form small, cooperative groups, and each group will make one set of "what if" changes to the budget to show the impact of the change on the overall budget. These spreadsheets will be reviewed by the teacher for accuracy, and then each set will be sent to the appropriate class.

Integration Partner Course: Algebra I
Horticulture
General Mechanical Repair
Home Economics

Essential Elements: Algebra I: 2a, 2b, 2c, 3i, 6d **TAAS:** 2f, 6, 7, 8, 9, 12a, 13a, 13b

Collaborative Topics: Algebra I: rates and proportion, linear equations

Integration Partner Activity: The algebra class will use the spreadsheet format of their budgets in organizing data and will submit two "what if" changes for the microcomputer applications class to compute.

Two "what if" statements will also be submitted by each of the following classes: horticulture, general mechanical repair, and home economics.

Course: Microcomputer Applications **Lesson Topic:** Spreadsheets

Essential Elements: 4b, 4c, 4d

Lesson Objective: Students will be able to enter data into a spreadsheet program and then produce a bar graph illustrating the data.

Materials: Hourly attendance data for a public swimming pool over a seven-day period.

Activity: Students will enter swimming pool attendance data into a spreadsheet program and then create a bar graph from that information.

Evaluation Activity: The spreadsheet and bar graph developed.

Integration Partner Course: Algebra I

Essential Elements: 2a, 3g, 3h

Collaborative Topics: Interpreting graphs, formulas and monomials

Integration Partner Activity: The spreadsheet printout and bar graph produced by the microcomputer applications class along with the raw data will be used by the algebra class for problem-solving activities using formulas and in interpreting graphed information.

Course: Microcomputer Applications **Lesson Topic:** Spreadsheets

Essential Elements: 4c, 4d

Lesson Objective: Students will be able to compute the amount of interest that accrues over the life of a loan at different rates of payoff.

Materials: Interest schedules, newspaper advertisements

Activity: The students will be given the purchase price of a home and an interest schedule. Each student will compute the total payoff for a home financed at 10 years, 15 years, and 30 years at interest rates of 8.5%, 10%, and 12%. A bar graph should be created to illustrate the differences between cases.

Evaluation Activity: The students will be given newspaper advertisement sections and told to "go on a $5,000 shopping spree." The students are to put some of their imaginary purchases on department store credit cards and other purchases on bank credit cards, with no fewer than four credit cards involved in the purchases. The varying interest rates for the cards will be assigned by the instructor. Students are to figure the total cost of their shopping spree, paying out their bills at the minimum payment per month.

Integration Partner Course: Algebra I

Essential Elements: 3b, 3j, 4c, 4d, 5b, 5d **TAAS:** 3a, 10, 11f, 12b

Collaborative Topics: Formulas and monomials, quadratics

Integration Partner Activity: Spreadsheet printouts and graphs will be used by the algebra class in selecting formulas to solve everyday problems and in applying quadratics to real-life situations.